

Design and Development of Attachable Mini Trash Box Holder for Drafting Table

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Abstract: *The objective of this study is to design and develop an attachable mini trash box holder which will be attached to the drafting table of the students. It was designed for the user to have an accessible trash box where they can dispose their garbage, particularly the pencil shavings, paper waste, and other cut materials during the making of miniatures. Thus, it will maintain the cleanliness of the user's table, and so the classroom. The study used a descriptive developmental research design, and weighted mean as the statistical tool in analyzing the data. A sample population of 30 participants are the BSIT-ADT students from first to third year of Surigao del Norte State University. They were the respondents of the online survey using google form and were selected using the Stratified random sampling. The respondents evaluated the attachable holder according to its manageability in table 1, with a weighted mean of 3.70 which means Accessibility in table 2 got a weighted mean of 3.50, which also means Table 3 containing the effectiveness in terms of Aesthetics got 3.65 which indicates economy in table 4, got 3.71 terms of safety got 3.56, which means Very Effective. As per findings, the respondents have seen that the attachable mini trash box holder has a positive impact based on its effectiveness in terms of Manageability, Accessibility, Aesthetics, Economy, and Safety. It was acknowledged by the*

Keywords: Architectural Drafting, Attachable Mini Trash Box, Drafting Table, Miniature

I. INTRODUCTION

The science and art of building design is known as architectural drafting, which also serves as a visual communication tool for architects. The skills taught to students in this course include reading blueprints, creating product specifications, manufacturing processes and materials, and drawing and building models using either a computer-aided design (CAD) program, which prints out the design from a computer, or a manual method using drawing pens, rulers, and blueprint paper (Hawkins, 2010). Asthana (2011) states that a significant shift in infrastructure occurred when the designing process was transferred to computer software. This was made possible by the ability to observe building designs through dimensions and to try out original improvisations and improvements. This saves a great deal of money and the architects' time by doing away with the requirement to create a separate design sheet for each and every dimension of the construction. Jacques (2010) highlighted the requirement for exceptional drawing abilities in order to work as an architectural design drafter. However, in order to succeed in this sector, students must not only focus on learning new skills but also develop strong communication abilities in order to pass interviews and collaborate with engineers, architects, and other construction workers.

Classroom activities such as drawings and making paper artworks may leave the most commonly seen trashes in a classroom, which are waste and cut up papers, pencil shavings, and others. This will make , but the whole classroom look messy. Trash cans in schools are located somewhere in a corner or outside just beside the door. In that case, students have to leave their designated seats just to throw their garbage into the trash can(s), especially the pencil shavings. Working comfortably and productively also means having a neat workspace or table. As cited by (Soewarde et al., 2016), one of the the working environment. The objective of this research is to develop and propose an Attachable Mini Trash Box Holder. A sample population of 30 participants from first to third year BSIT-ADT students were the respondents of an online survey questionnaires using Google form. Having an accessible trash box will lessen the distractions to both students and teachers/instructors. They [students] do not have to leave their seats during the discussions and or while working on a task. Thus, this will also minimize the interruption to the

Furthermore, it will also teach the students to be responsible with their own garbage.

II. REVIEW OF LITERATURE

Cleanliness means keeping our body, mind, and everything around us clean. It is the first law of health, and the way to stay healthy and lead life peacefully (Gatarin, 2020). Waste basket are common items in many households and offices. They are essential for keeping a space clean and organized. One innovative use of waste baskets is to hang them on a wall or the side of a desk to create additional space. By hanging waste baskets, individuals can easily dispose items such as paperwork, books, or office supplies (Busch Systems Canada, n.d.-b).

Trash cans and recycling bins play an important role in keeping school campuses clean. Having the right trash can in the right place discourages littering and having clearly labeled recycling bins make it easy for your school to stay green. Whether you need a trash can for the quad, the computer lab, or the cafeteria, there is a trash can for you (Unlimited, 2018). A trash can holder is an essential tool to support a trash can and keep your indoor and outdoor space clean and organized. Whether you are looking to conceal unsightly garbage cans or simply want a more aesthetically pleasing space, a trash can holder is the perfect solution. Trash can holders come in a variety of materials, such as wood, metal, and plastic, allowing you to choose the best option that suits your needs. Maintaining the physical working environment according to the comfort standard will improve their Quality of Experience (QoE), (Ain et al., 2021b). That is why it is very important to have a trash box that is accessible to the working area. Thus, trash cans or mini-trash boxes will keep the area clean and at the same time, the students will work comfortable and productively.

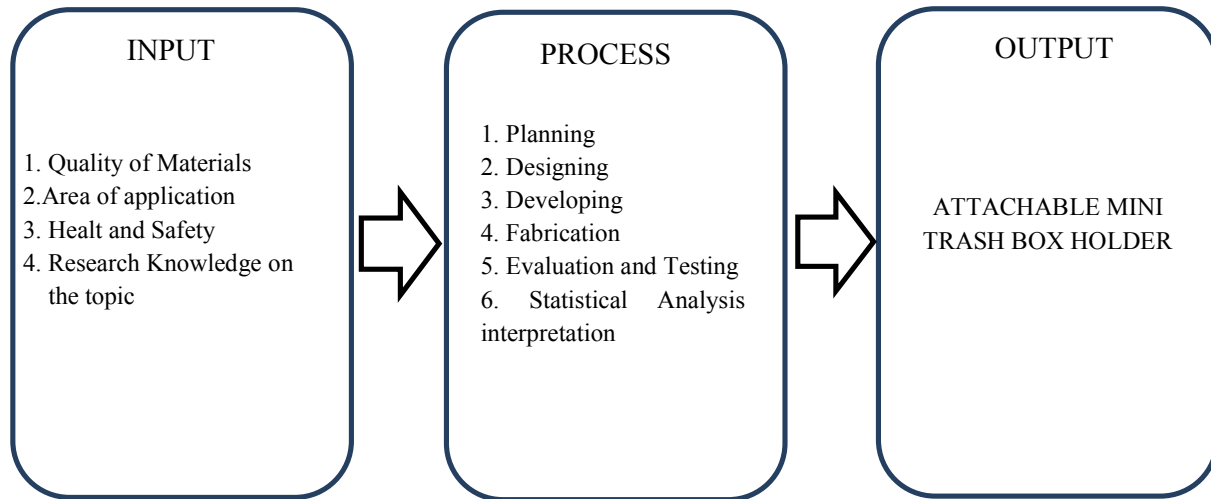
DRAFTING TABLE

It is typically used for drawing art and drawing and editing blueprints. It is used by artists and architects. However, more and more people have been using drafting tables as desks, conference tables, and dining tables.

The primary use of a drafting table is to draw art or editing blueprints while standing up. You want to have a drafting table that has a tillable surface that allows you to work from a variety of angles so that you can visualize your subject matter from different vantage points. Many newer drafting tables are height adjustable, with a tilting mechanism that allows for proper ergonomics and the ability to sit or stand while working. Drafting tables can come in a variety of styles and sizes (Jhonson 2015). As a result, other drafting table uses can include just about any desk job and it is not relegated to just artists, architects, and engineers. The modern form of the drawing board is referred to as a drafting table or **multipurpose desk**. Well, during the Industrial Revolution, draftsmanship become a specialized trade that resulted in these “drawing boards” migrating out of libraries and into offices. Perhaps the greatest draftsman of all time is Leonardo da Vinci. Back in 2003, the Metropolitan Museum of Art in New York featured a rare exhibit of rarely-seen work from the master draftsman. But more and more, drafting tables are used for a variety of jobs and are used at home and at offices.

III. CONCEPTUAL FRAMEWORK

The framework of this study was anchored on the study of Ayag (2018) which emphasizes Portability is the main objective of the drafting table. It is seen from the figures that the portable drafting table is designed to cater the needs of the students taking up interior design. It is portable, foldable and one piece for easy transport. It is developed using locally accessible resources. It is easily assembled using butterfly hinged. Compared to other drafting table in the market the developed portable and foldable drafting table is cheaper. Figure 1 appears the Conceptual Framework of the study. The inputs are the tools and materials that will be utilized within the development of the Attachable Mini Trash Box Holder. The investigate process arranging and planning creating and real development of the AMTBH testing of the project, taken after by the evaluation of the project through surveys, and lastly, the statistical analysis and interpretation. The output is the assessed and tested Attachable Mini Trash Box Holder.



Statement of the Problem

This study focuses on the effectiveness of the Adjustable Mini Trash Box Holder (AMTBH). Specifically, this study seeks to answer the following:

1. What is the perception of the respondents on the effectiveness of the model in terms of Manageability as to?
 - a. Comfort;
 - b. Convenience;
 - c. User friendly;
 - d. Durability; and
 - e. Operational.
2. What is the perception of the respondents on the effectiveness of the model in terms of Accessibility as to?
 - a. Location;
 - b. Receptiveness;
 - c. Obtainability;
 - d. Usability; and
 - e. Approachability.
3. What is the perception of the respondents on the effectiveness of the model in terms of Aesthetics as to?
 - a. Color Appeal;
 - b. Attractiveness of the design;
 - c. Appropriateness of the size;
 - d. Originality of the design; and
 - e. Quality of the design.
4. What is the perception of the respondents on the effectiveness of the model in terms of Economy as to?
 - a. Materials are available at the local market;
 - b. Economy in terms of labor and time;
 - c. Economical materials; and
 - d. Affordability of the product;
5. What is the perception of the respondents on the effectiveness of the model in terms of Safety as to?
 - a. Absence of sharp edges;
 - b. Provision for protection;
 - c. Functions safely;
 - d. Harmless; and
 - e. Nontoxic.

Objectives of the Study

The generally objectives of the study, aims to:

1. Design an Attachable Mini Trash Box Holder (AMTBH).
2. Develop an Attachable Mini Trash Box Holder (AMTBH).
3. Construct an Attachable Mini Trash Box Holder (AMTBH).
4. Evaluate an (AMTBH)based on its acceptance level in terms of Manageability, Accessibility, Aesthetics, Economy, and Safety by the identified respondents.

Significance of the Study

This research will utilize a mini trash box which will be inserted to the attachable holder. Some of the project's goals are to make the user's workspace neat, easier, more efficient, and at the same time, have an accessible trash box that will help the users maximize their time while drawing.

Scope and Limitation

This study focuses on the creation of an Attachable Mini Trash Box Holder, which is intended for hand-drawn works or during the creation of manual drawings and miniatures, considering the users functionality, neatness, and their ability to save time. The study will make use of descriptive development method of research. A sample population of 30 participants from first to third year BSIT-ADT students will be the respondents of an online survey questionnaires using Google form. The total of 30 respondents will be selected using Stratified Random Sampling, in which researchers' divide subjects into subgroups called strata based on characteristics that they share (e.g., educational attainment). Once divided, each subgroup is randomly sampled using another probability sampling method.

IV. METHODS**Project Design****Design Consideration**

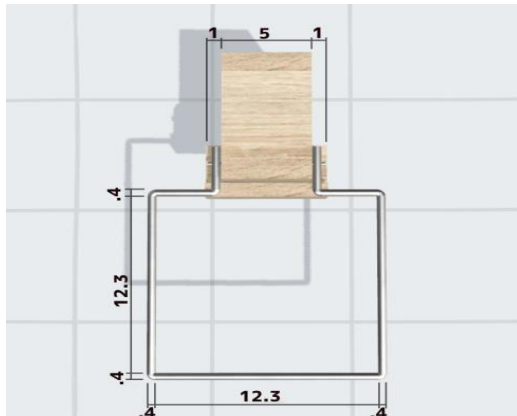
In designing the Attachable Mini Trash Box Holder, the following factors have been considered:

- Size - The size of the project was considered, so it will not bother the users while working.
- Accessibility - It is accessible to the users [students] since the project is attachable into the users' table.
- Color- The project must be painted with black to protect it from corrosion and at the same time, to make it look harmoniously to the drafting student's table.
- Placement - The project should be placed or attached to the right side of the table's horizontal bar.
- Cost- The cost will be minimized since it will not use a lot of steels.
- Materials - Materials to be used are always available from the market.

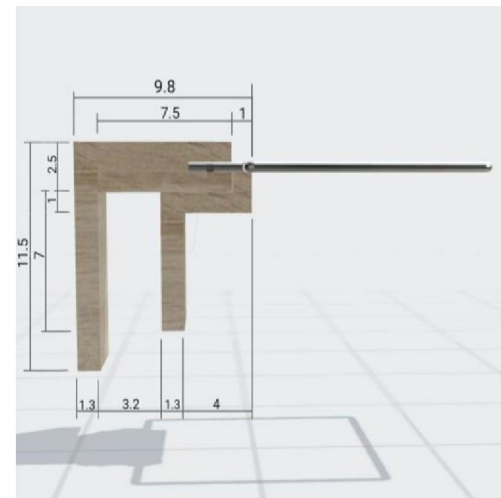
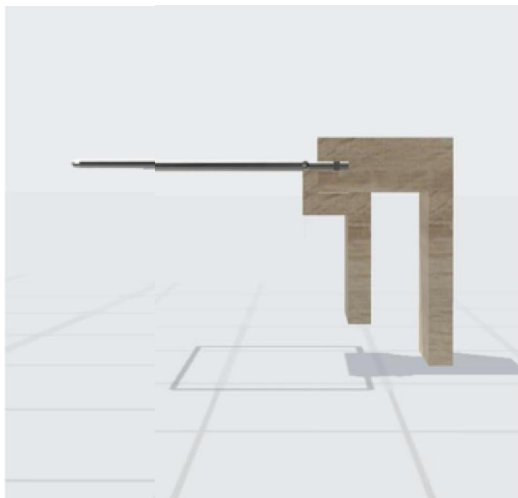
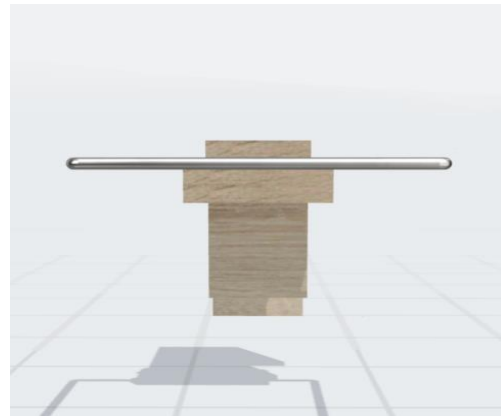
Orthographic and Pictorial Views of the Project

Several sketches were done to come up with the final design. Below are the orthographic views of the final design of the Attachable Mini Trash Box Holder (AMTBH).

Top View



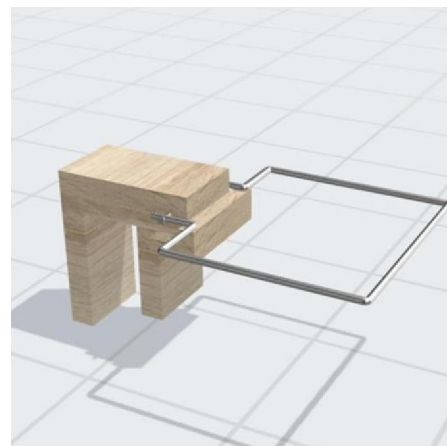
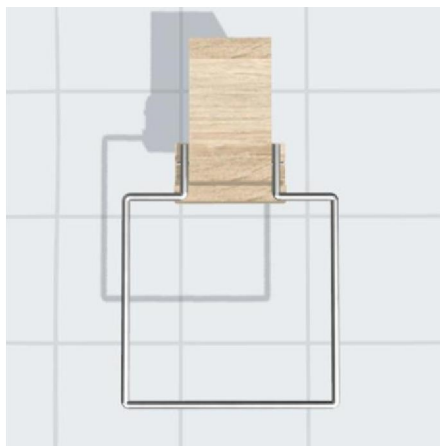
Front View



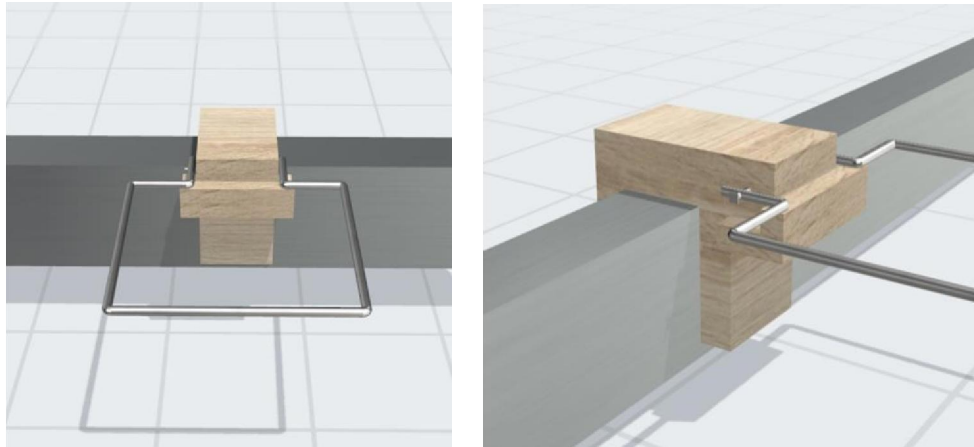
Right Side View

Left Side View

The Study made use of Building Information Modeling (BIM) software like Moblo in modeling the final design. Below are the pictorial views of the Attachable Mini Trash Box Holder (AMTBH).



Pictorial View of the Attachable Mini Trash Box Holder (AMTBH)

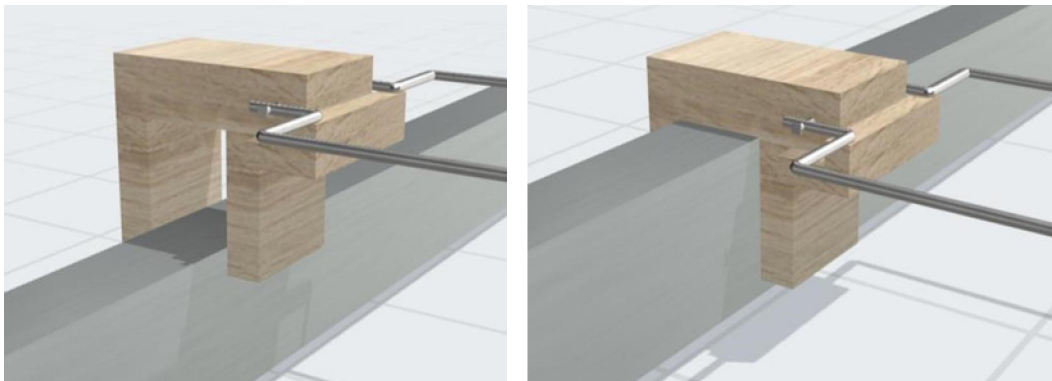


Pictorial View of the Mini Trash Box Holder being attached.

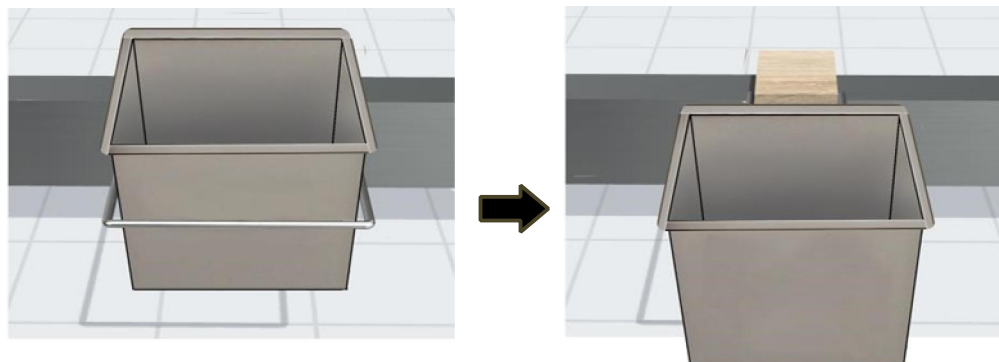
Operation and Testing Procedure

Below are the proper steps that demonstrates on how to attach the holder to the user s table, and on how to insert the trash box.

Pictorial drawings showing the steps on how to attach the Mini Trash Box Holder.



Pictorial drawings showing on how to put the Mini Trash Box into the Attachable Holder.



V. RESULTS AND DISCUSSIONS

The researchers did a survey using google forms. 30 Architectural Drafting students from first to third year in Surigao del Norte State University had rated the model's effectiveness in terms of manageability, accessibility, aesthetics, economy, and safety. Using the scale below the results of the evaluation are the following:

Point	Qualitative Description
4	Very Effective
3	Effective
2	Less Effective
1	Not Effective

Table 1: Model's Effectiveness in terms of Manageability

Concerned Area	Respondents N=30				X	VI
	4	3	2	1		
	VE	E	LE	NE		
Comfort and Convenience	21	9	0	0	3.70	VE
User friendly	23	5	2	0	3.70	VE
Weighted Mean	3.70					
Interpretation	Very Effective					

Table one (1) shows the insights of the respondents on the model's effectiveness in terms of Manageability as to: 'Comfort and convenience; and user friendly' with weighted mean of 3.70, rated by the 30 respondents and described as "Very Effective. The average weighted mean is 3.70, indicating that the respondents confirmed the model's effectiveness in terms of Manageability.

Table 2: Model's Effectiveness in terms of Accessibility.

Concerned Area	Respondents N=30				X	VI
	4	3	2	1		
	VE	E	LE	NE		
Location	16	13	1	0	3.50	VE
Weighted Mean	3.50					
Interpretation	Very Effective					

Table two (2) reveals the perspective of the respondents on the model's effectiveness in terms of accessibility as to: Location, with weighted mean of 3.50, which is also described as "Very Effective". The average weighted mean is also 3.50, which means the respondents confirmed the model's effectiveness in terms of Accessibility.

Table 3: Model's Effectiveness in terms of Aesthetics.

Concerned Area	Respondents N=30				X	VI
	4	3	2	1		
	VE	E	LE	NE		
Color Appeal	21	6	3	0	3.60	VE
Attractiveness of the design	23	4	3	0	3.67	VE
Appropriateness of the size	20	10	0	0	3.67	VE
Weighted Mean	3.65					
Interpretation	Very Effective					

Table three (3) shows the respondents' viewpoints on the model's effectiveness in terms of Aesthetics as to: 'Color Appeal' with 3.60 weighted mean, 'Attractiveness of the design' which has 3.67, and 'Appropriateness of the size' with 3.67 weighted mean and are all rated as "Very Effective". The weighted average score is 3.65, indicating that respondents believed that the model is very effective in terms of Aesthetic Value.

Table 4: Model's Effectiveness in terms of Economy.

Concerned Area	Respondents N=30				X	VI
	4	3	2	1		
	VE	E	LE	NE		
Materials are available at the local market	24	4	2	0	3.73	VE
Economy in terms of labor and time	21	9	0	0	3.70	VE
Weighted Mean	3.71					
Interpretation	Very Effective					

Table four (4) shows the perspective of the respondents on the model's effectiveness in terms of "Economy" as to: 'Materials are available at the local market' and 'Economy in terms of labor and time' which have weighted means of 3.73 and 3.70. And are rated as "Very Effective". The average weighted mean is 3.71, which means that the respondents confirmed the model's effectiveness in terms of Economy.

Table 5: Model's Effectiveness in terms of Safety.

Concerned Area	Respondents N=30				X	VI
	4	3	2	1		
	VE	E	LE	NE		
Absence of sharp edges	19	9	2	0	3.56	VE
Provision for protection	20	7	3	0	3.56	VE
Weighted Mean	3.56					
Interpretation	Very Effective					

As indicated in the table five (5), the perception of the respondents on the effectiveness of the model in terms of "Safety" as to: 'Absence of sharp edges' and 'Provision for protection' both have weighted means of 3.56 and implies as "Very Effective". The weighted average score is 3.56, which considers the model as very effective.

VI. CONCLUSION

As per the findings, the respondents have seen that the attachable mini trash box holder has a positive impact based on its effectiveness in terms of Manageability, Accessibility, Aesthetics, Economy, and Safety. It was also acknowledged by the drafting students as very effective. The developed Attachable Mini Trash Box Holder is highly suggested for giving the drafting students an accessible trash box, especially when doing works that leaves common wastes in the room. This will serve as a guide to the future researchers for further studies and improvements for the current developed design. It must be patented and distributed.

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